1. A device comprising:

a first optical circulator having first, second, and third ports, said first port being supplied with

first signal light including first and second polarization components respectively having first and second polarization planes orthogonal to each other, and with first pump light;

a second optical circulator having fourth, fifth, and sixth ports, said fourth port being supplied with second signal light including third and fourth polarization components respectively having third and fourth polarization planes orthogonal to each other, and with second pump light;

a polarization beam splitter having seventh, eighth, ninth, and tenth ports, said seventh port being optically connected to said second port, said tenth port being optically connected to said fifth port, said seventh and eighth ports being coupled by said first polarization plane, said seventh and ninth ports being coupled by said second polarization plane, said ninth and tenth ports being coupled by said third polarization plane, said eighth and tenth ports being coupled by said fourth polarization plane; and

a polarization maintaining fiber having first and second ends, and having first and second polarization modes to be maintained between said first and second ends, said first end being optically connected to said seventh port so that said first and fourth polarization planes

are respectively adapted to said first and second polarization modes, said second end being optically connected to said eighth port so that said second and third polarization planes are respectively adapted to said first and second polarization modes.

2. A device according to claim 1, wherein said polarization maintaining fiber has a substantially constant zero-dispersion wavelength in relation to each of said first and second polarization modes, and each of said first and second pump lights has a wavelength substantially equal to said zero-dispersion wavelength.

3. A device according to claim 1, wherein:

said first signal light is converted into first converted signal light by four-wave mixing based on said first signal light and said first pump light in said polarization maintaining fiber, said first converted signal light being output from said third port of said first optical circulator; and

said second signal light is converted into second converted signal light by four-wave mixing based on said second signal light and said second pump light in said polarization maintaining fiber, said second converted signal light being output from said sixth port of said second optical circulator.

4. A device according to claim 3, wherein said first and second converted signal lights are phase conjugates of said first and second signal lights, respectively.

5. A system comprising:

first and second optical fiber networks each adapted to wavelength division multiplexing; and

a converter connected between said first and second optical fiber networks;

said converter comprising:

first and second pumping sources for outputting first and second pump lights, respectively;

a first optical circulator having first, second, and third ports, said first port being supplied with first signal light including first and second polarization components respectively having first and second polarization planes orthogonal to each other, and with said first pump light;

a second optical circulator having fourth, fifth, and sixth ports, said fourth port being supplied with second signal light including third and fourth polarization components respectively having third and fourth polarization planes orthogonal to each other, and with said second pump light;

a polarization beam splitter having seventh, eighth, ninth, and tenth ports, said seventh port being optically connected to said second port, said tenth port being

optically connected to said fifth port, said seventh and eighth ports being coupled by said first polarization plane, said seventh and ninth ports being coupled by said second polarization plane, said ninth and tenth ports being coupled by said third polarization plane, said eighth and tenth ports being coupled by said fourth polarization plane; and

a polarization maintaining fiber having first and second ends, and having first and second polarization modes to be maintained between said first and second ends, said first end being optically connected to said seventh port so that said first and fourth polarization planes are respectively adapted to said first and second polarization modes, said second end being optically connected to said eighth port so that said second and third polarization planes are respectively adapted to said first and second polarization modes.

6. A system according to claim 5, wherein:

said first signal light is converted into first converted signal light by four-wave mixing based on said first signal light and said first pump light in said polarization maintaining fiber, said first converted signal light being output from said third port of said first optical circulator; and

said second signal light is converted into second converted signal light by four-wave mixing based on said second signal light and said second pump light in said polarization maintaining fiber, said second converted signal light being output from said sixth port of said second optical circulator.

7. A system according to claim 5, wherein said first and second converted signal lights are phase conjugates of said first and second signal lights, respectively.